Can an interactive digital game help French learners improve their pronunciation?

Walcir Cardoso[1], Avery Rueb[2], and Jennica Grimshaw[3]

Abstract. This study examines the effects of the pedagogical use of an interactive mobile digital game, *Prêt à Négocier* (PàN), on improving learners' pronunciation of French as a Second Language (FSL), using three holistic measures: comprehensibility, fluency, and overall pronunciation. Two groups of FSL learners engaged in different types of game-playing over one month: while the experimental group played PàN, the control group engaged in paper-based gamified information gap activities. Following a pre-test/post-test research design, our findings revealed no statistically significant differences between the two groups.

Keywords: digital gaming, L2 pronunciation, French.

1. Introduction

Second/foreign language (L2) pronunciation is often evaluated based on at least three criteria (e.g. Derwing, Rossiter, Munro, & Thomson, 2004): users' intelligibility (the extent to which non-native speech can be understood by others), comprehensibility (the listener's perceptions of how difficult to understand the speech is), and fluency (one's ability to speak in an efficient, effortless manner). In L2 pedagogy, one of the key recommendations for developing pronunciation is practice, preferably involving repetition and the recycling of already-acquired features (Nation & Newton, 2009), in an interactive environment (Zielinski, 2012). However, because of time constraints, these goals are not easily achievable. One way to fulfill these recommendations and circumvent time constraints is via the use of tools that promotes interaction among interlocutors, motivates learners to reuse their linguistic skills, and allows them to practice on their own in a meaningful, fun

1. Concordia University, Montreal, Canada; walcir.cardoso@concordia.ca
2. Vanier College, Montreal, Canada; rueba@vaniercollege.qc.ca
3. Concordia University, Montreal, Canada; jennica.grimshaw@gmail.com

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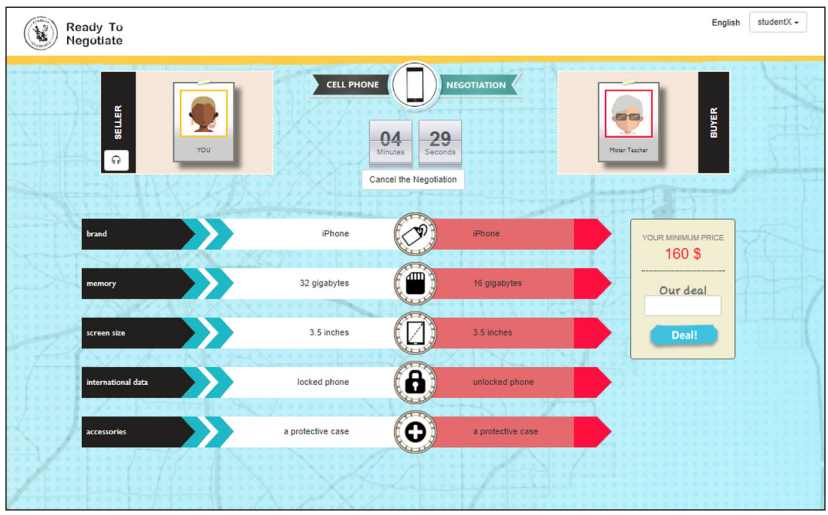
environment. We believe that PàN (developed by Avery Rueb, Walcir Cardoso, and Affordance Studio – http://app.readytonegotiate.com) fulfills these criteria.

PàN is a digital information gap activity designed to help French students develop their oral interaction skills. It can be played on mobile and static devices, both in face-to-face interactions in the classroom or at home via chat. To succeed in game-playing, students are required to exchange information about a product to buy/sell (e.g. a cell phone), and negotiate with a partner to arrive at a final price within a three minute time frame. Figure 1 illustrates the seller's version of the game's interface in English.

Figure 1. PàN interface



Our goal was to examine the effects of the pedagogical use of PàN on improving French learners' pronunciation, which we hypothesised to positively impact its development (see Hwang et al., 2016 for the rationale, in the context of L2 speaking). Accordingly, the study was guided by the following question: Can PàN help French learners improve their pronunciation on three measures of oral ability – comprehensibility, fluency, and overall pronunciation?

2. Method

The participants were 40 students (average age: 20) enrolled in an intermediate-level FSL class in a pre-university institution (cégep) in Québec, Canada. The goal

of the course was to develop French language skills to prepare beginner students for more advanced courses.

The participants were stratified into two groups: while the experimental group (n=22) played PàN, the control group (n=12) engaged in paper-based gamified information gap activities (e.g. Perfect Partner, where students moved around the classroom asking questions to find students with similar information on their card, under time constraints to emulate most features of PàN). These game-playing sessions lasted approximately 25 minutes each, and were conducted biweekly over a period of four weeks, for a total of approximately 200 minutes of gameplay.

The study followed a pre-/post-/delayed post-test design and measured the participants' improvement in French pronunciation in three dimensions, as assessed by 16 judges: comprehensibility, fluency, and overall pronunciation abilities (an impressionistic evaluation of speech combining segmental and prosodic features such as stress, rhythm, and intonation).

The judges were asked to rate ten second randomised excerpts of speech by participants performing a picture-narrative task based on the "Suitcase Story" (Derwing et al., 2004), over the three testing phases. After listening to each excerpt, the judges were asked to indicate, on a six item Likert scale, how they rated that participant's pronunciation based on the three dimensions adopted.

3. Results

Based on a six point Likert scale, judges' ratings for comprehensibility, fluency, and overall pronunciation abilities were examined at the pre-, post-, and delayed post-tests (see Table 1 for means and standard deviations).

As the data are non-parametric, a Wilcoxon Signed-Rank test was conducted based on a student's mean rater score for each of the three measures between two given tests. A summary of the findings is provided below:

- For comprehensibility, the treatment group showed no significant difference between pre- and post-tests (Z=-1.39, p=0.16), nor between the pre- to delayed post-tests (Z=-0.73, p=0.17). Similarly, the control group showed no improvement between pre- and post-tests (Z=-0.311, p=0.76), nor between the pre- to delayed post-tests (Z=-0.47, p=0.64).

- For fluency, the treatment group showed no significance between pre- and post-tests (Z=-1.92, p=0.055), nor pre- and delayed post-tests (Z=-1.48, p=0.14). The control group also showed no improvement between pre- and post-tests (Z=-0.59, p=0.56), nor between the pre- to delayed post-tests (Z=-0.24, p=0.81).

- For overall pronunciation abilities, again we see no significance for the treatment group between pre- and post-tests (Z=-0.98, p=0.33), nor pre- and delayed post-tests (Z=-1.37 p=0.17). The control group also showed no improvement between pre- and post-tests (Z=-1.10, p=0.27), nor between the pre- to delayed post-tests (Z=-1.03, p=0.30).

Table 1. Judges' ratings

		Pre-test		**Post-test**		**Delayed post-test**	
Measure	Group	M	SD	M	SD	M	SD
Comprehensibility	Treatment	2.85	0.92	3.25	0.91	3.08	1.00
	Control	2.98	0.83	3.10	1.13	2.82	0.81
Fluency	Treatment	2.18	0.65	2.55	0.88	2.53	0.93
	Control	2.33	0.74	2.45	0.91	2.41	0.61
Pronunciation	Treatment	2.27	0.66	2.50	0.76	2.59	0.80
	Control	2.41	0.60	2.60	0.86	2.29	0.65

Mann-Whitney U tests were also conducted to compare improvement between groups for each measure in each test. Results (displayed in Table 2) indicate no significant difference.

Table 2. Mann-Whitney U between-groups comparison

	Pre-test		**Post-test**		**Delayed post-test**	
Measure	U	p-value	U	p-value	U	p-value
Comprehensibility	127.00	0.86	125.50	0.82	111.00	0.45
Fluency	117.00	0.59	131.50	0.99	127.00	0.86
Pronunciation	120.50	0.68	113.00	0.49	108.50	0.40

In summary, despite a trend toward significance found for fluency between pre- and post-tests (p=.055), these results show that game-playing had no effect on improving the participants' overall pronunciation, considering the three measures employed in the study: comprehensibility, fluency, and overall pronunciation abilities.

4. Discussion and conclusions

We hypothesised that the motivation and 'forced output' engendered by interactive games such as PàN would encourage learners to practice language and, via systematic repetition (Nation & Newton, 2009) and negotiation with their interlocutors (Swain & Lapkin, 1995), improve their L2 linguistic knowledge, particularly in terms of fluency – the use of language in an efficient, effortless manner. However, the results of the three pronunciation tests adopted to assess L2 pronunciation skills suggested that, based on listeners' perceptions, game-playing had no effect on the improvement of FSL learners' pronunciation, despite a trend towards significance for oral fluency. It is possible that these results are due to the brevity of the one month treatment, which seems insufficient for the development of the three aspects of pronunciation in this study. Focusing on fluency, the non-significance observed might be due to the nature of the impressionistic measures adopted, based merely on judges' ratings.

In future studies, we aim to triangulate the analysis by incorporating other quantitative measures to assess L2 pronunciation development, including temporal measures, such as rate of speech and pause length. It is also possible that the information gap activity model used for both experimental and control groups was equally effective (though not statistically significant), with the digital component having little effect on the outcomes. Indeed, the trend in increased fluency for the experimental group suggests that digital game-playing placed more pressure on students to speak faster than its paper-based counterpart, as having an on-screen countdown may be more effective than watching a wall clock.

Despite the lack of significance for L2 pronunciation, based on a previous study (Rueb, Cardoso, & Grimshaw, 2016), we believe that PàN has the potential of enhancing the learning of FSL, at least in areas such as vocabulary acquisition (forthcoming research), the development of negotiation skills in speaking and listening, and the overall learning experience in a fun, gamified environment that can take place whenever and wherever learners feel *prêt à négocier*.

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